Calibrating Net scan data - 1

- Use T1•T3 triggers to map angular distributions of muons using SFT tracks

- Compare spectrometer angular distributions to those of each `*.m file`

- Correct `*.m file` data before attempting to match SFT tracks for candidate vertex

Procedure:

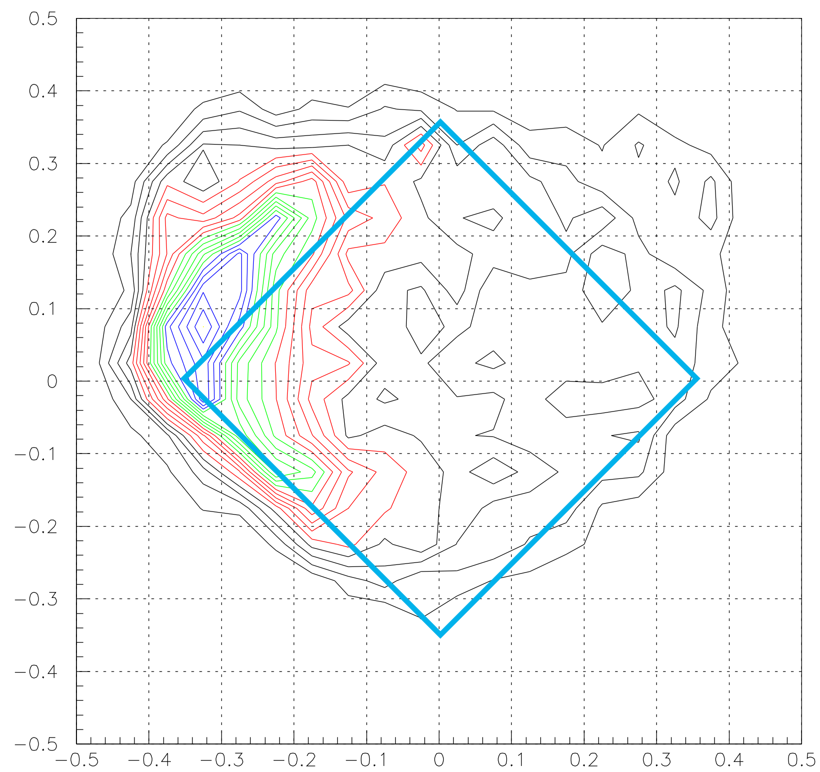
⁄ *Reconstruct tracks from T1¥T3 file compiled from 100 runs (courtesy A Kulik)*

⁄ *Compile angular distributions from different areas in the u-v plane*

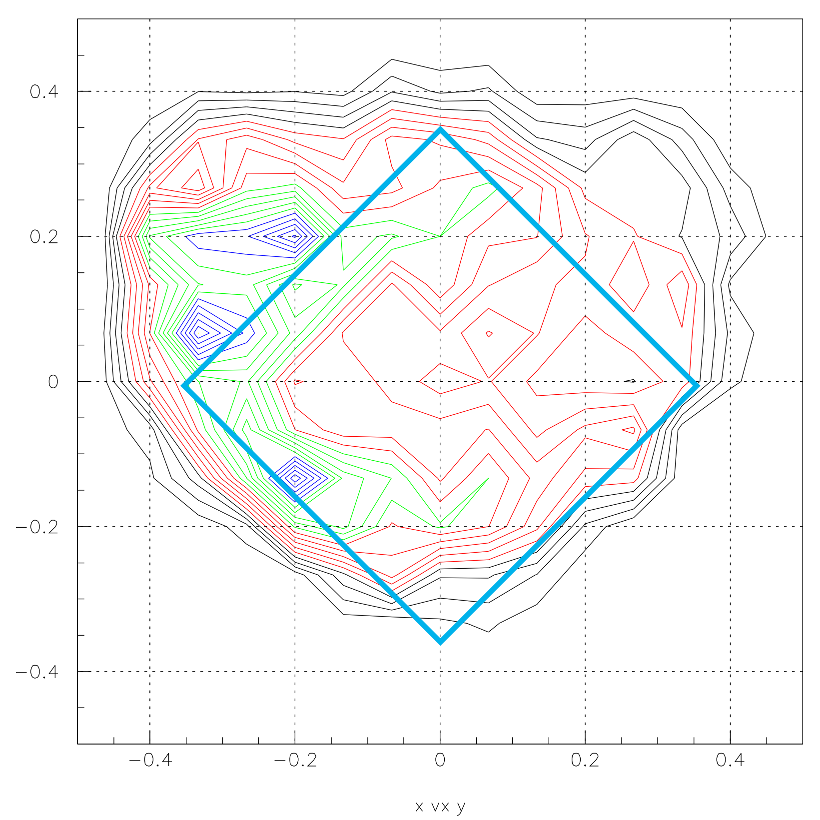
⁄ *Find positions of the "eyes" as a function of u,v and find parametric fit to "eye" positions*

Spatial Distribution of the Data

all data

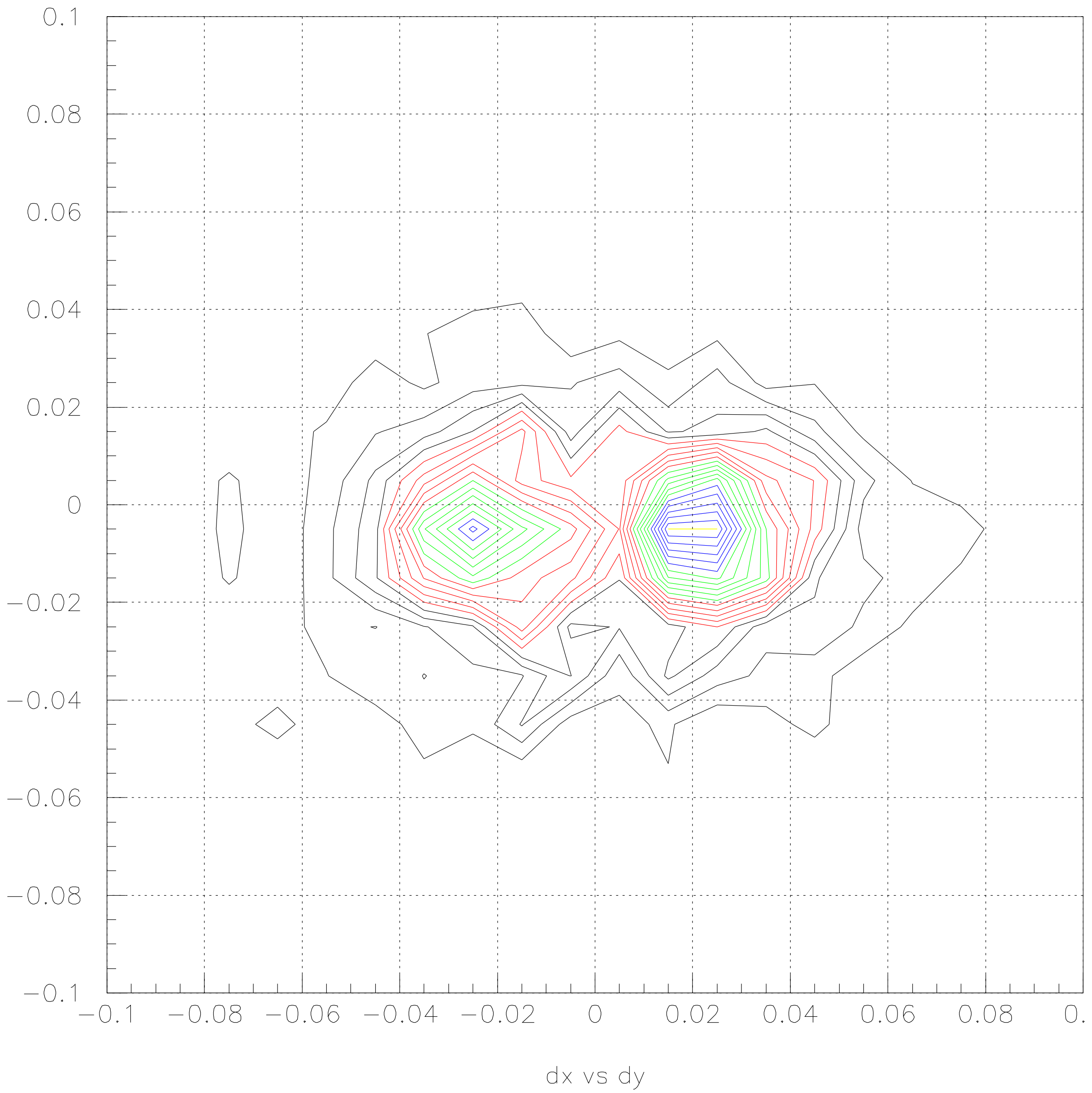


eyes only

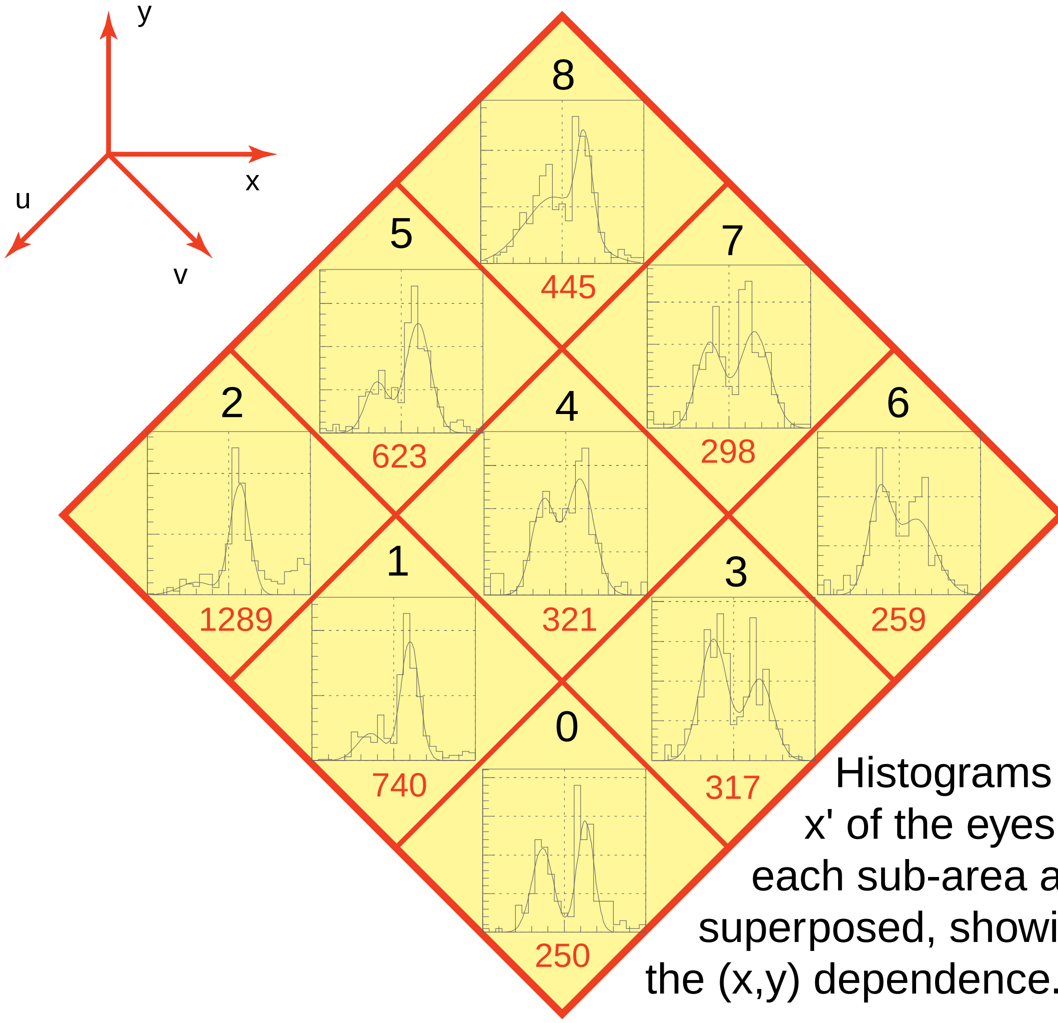


The Eyes

(plot is angle-space : { x' , y' })



Target Area divided into 9 sub-areas, chosen because of the available statistics: ~8000 events



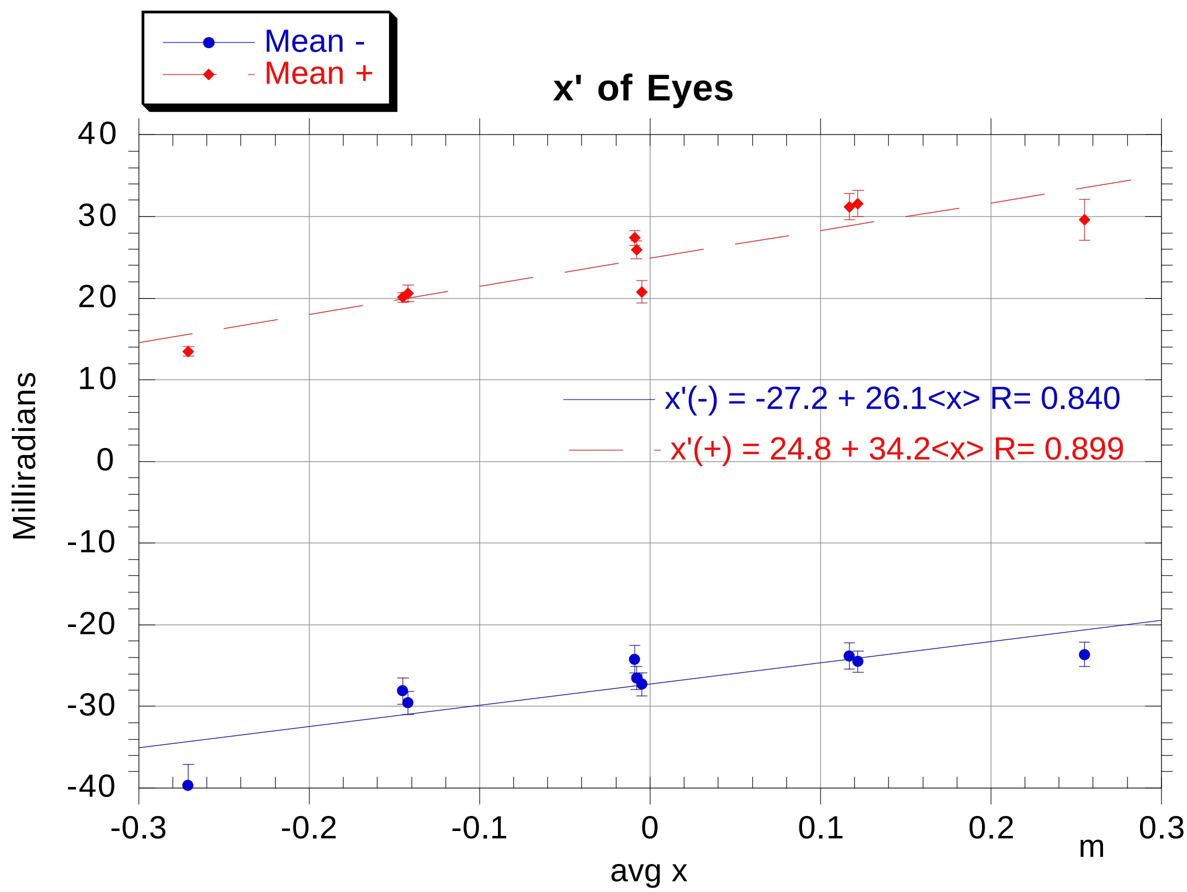
Histograms of x' of the eyes for each sub-area are superposed, showing the (x,y) dependence.

Each sub-area is 18×18 cm^2 ; red numbers are the total number of muons in each sub-area.

The Eyes' behaviour can be summarized:

- x' is a function of x only
- y' is a function of y only
- both eyes "move" together

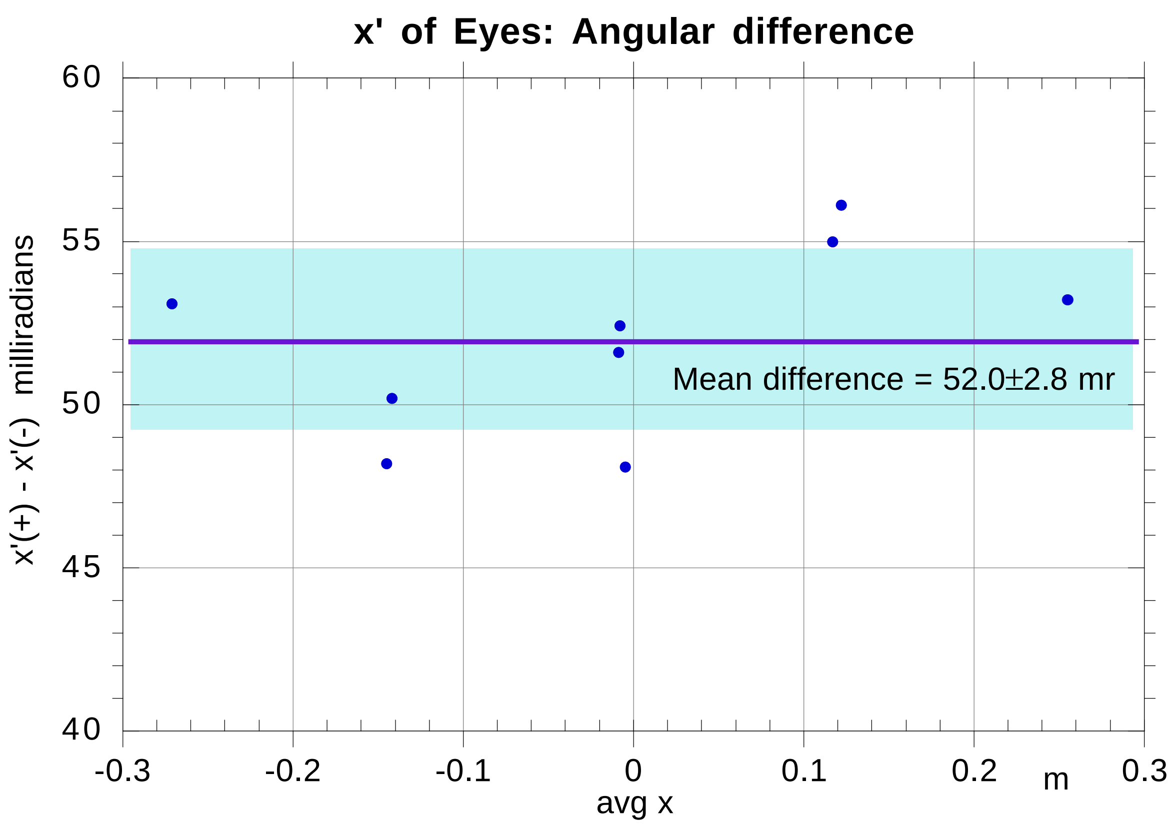
the $\langle x\rangle_i$ dependence...



...and the angular difference of the eyes is approximately constant...

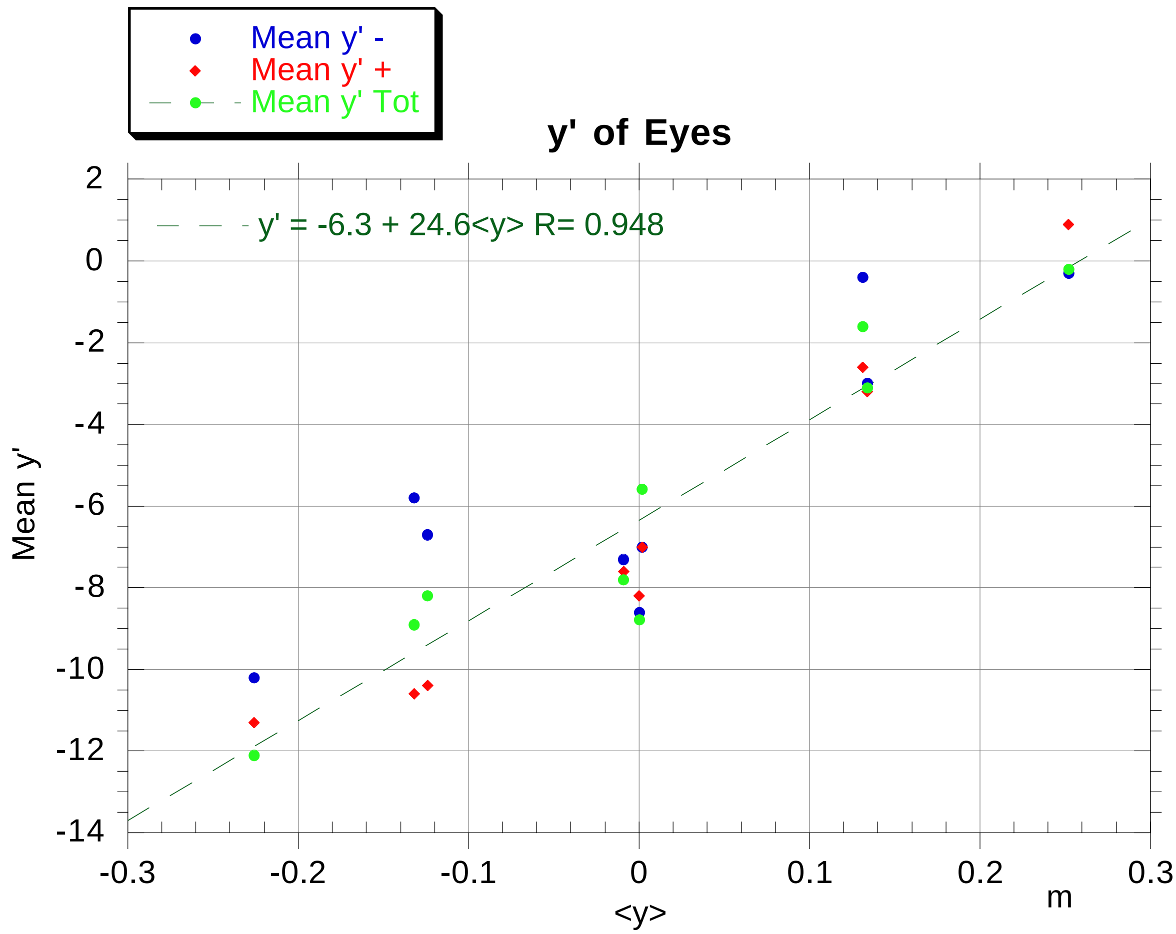
$$\langle x'(+)\rangle_i - \langle x'(-)\rangle_i$$

for each sub-area, i.



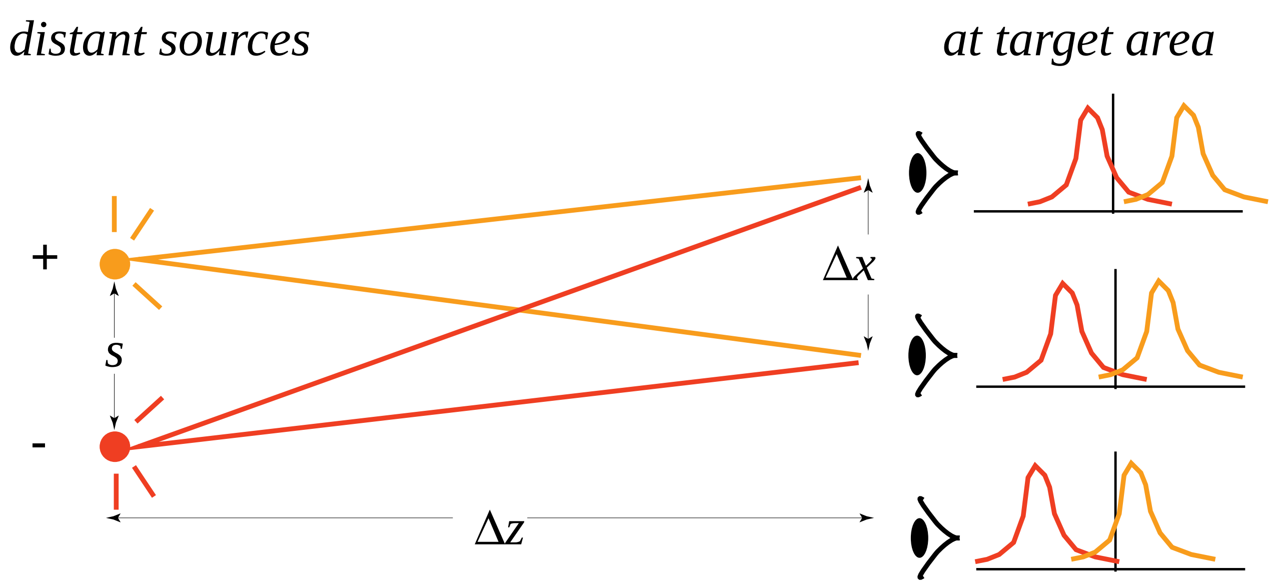
$\Rightarrow$ need only one eye to see (the offset)

... and the $\langle y \rangle_i$ dependence



There appears to be a small difference between <y(+)> and <y(-)> ; the green line is the fit to both eyes.

A plausible explanation -



From data, if $\Delta x = 0.4\mathrm{m}$, then the corresponding change of $<x'>$ for the eye(s) is 0.010 . This implies that the source is at a distance of $\Delta z = 40\mathrm{m}$.

Since the angle difference between the eyes is 0.050, this implies that $s = 2\mathrm{m}$.

This is the location of the yoke (return) steel of SELMA, and therefore, the true source is probably a upstream, beamline, source of background muons.